

**WHAT IS CLAIMED IS:**

**CLAIM 1.** A nozzle for dispensing a liquid, such as an elastomer for use with a rotational casting apparatus used to coat a body, comprising:

an interior flow passageway through which liquid flows;

said interior flow passageway defining a straight longitudinal axis along the length thereof, and having an inlet section, an intermediate section, and an outlet opening;

said intermediate section comprising a plurality of different portions, each said portion having a cross-sectional shape along said longitudinal axis different from a cross sectional shape of another of said plurality of different portions; each said cross-sectional shape being defined in a plane transverse to said longitudinal axis;

each said cross-sectional shape of each of said plurality of different portions defining a cross-sectional area substantially equal to the cross-sectional area of another said cross-sectional shape of said plurality of different cross-sectional shapes;

said outlet opening having a substantially elongated-like shape and having a cross-sectional area greater than said cross-sectional area of each said cross-sectional shape of said plurality of different cross-sectional shapes, whereby substantial laminar flow through said intermediate section and substantial equality of dwell-time of each hypothetical section of flowing liquid in said intermediate section occurs.

**CLAIM 2.** The nozzle according to claim 1, wherein said inlet section of said interior passageway comprises laminar-flow tubular section for ensuring laminar flow therein.

**CLAIM 3.** The nozzle according to claim 2, wherein said laminar-flow tubular section for ensuring laminar flow comprises a venturi-flow tubular portion, said venturi-flow tubular portion having an end-cross-section having a cross-sectional area substantially equal to said cross-sectional area of each of said plurality of different cross-sectional shapes.

**CLAIM 4.** The nozzle according to claim 1, wherein said plurality of different portions comprises a first series of substantially circular cross sections and second series of substantially ellipse-like cross sections.

**CLAIM 5.** The nozzle according to claim 4, wherein said plurality of different portions further comprises a third series of substantially elongated slot-like cross sections.

**CLAIM 6.** The nozzle according to claim 5, wherein at least some of said third series of substantially elongated slot-like cross sections are an oval-of-Cassini-like shape.

**CLAIM 7.** The nozzle according to claim 6, wherein said outlet opening is an oval-of-Cassini-like shape.

**CLAIM 8.** The nozzle according to claim 1, wherein said outlet opening is an oval-of-Cassini-like shape.

**CLAIM 9.** The nozzle according to claim 1, wherein said outlet opening comprises a cross-sectional area at least twice as great as said cross-sectional area of each said cross-sectional shape of said plurality of different cross-sectional shapes.

**CLAIM 10.** The nozzle according to claim 1, wherein said plurality of different portions shapes comprises a first series of substantially circular cross-sectional shapes, and a second series of substantially elongated cross-sectional shapes.

**CLAIM 11.** The nozzle according to claim 10, wherein at least some of said second series of substantially elongated cross-sectional shapes are an oval-of-Cassini-like shape.

**CLAIM 12.** The nozzle according to claim 11, wherein said outlet opening is an oval-of-Cassini-like shape.

**CLAIM 13.** The nozzle according to claim 12, wherein said outlet opening comprises a cross-sectional area at least twice as great as said cross-sectional area of said second series of cross-sectional shapes.

**CLAIM 14.** The nozzle according to claim 10, wherein each said cross section of said second series of substantially elongated cross-sectional shapes comprises a horizontal x-coordinate dimension and a vertical y-coordinate direction; each said cross section of said third series of elongated cross-sectional shapes having a x-y product different from that of any other respective said cross section of said third series.

**CLAIM 15.** The nozzle according to claim 1, wherein said inlet section of said interior passageway comprises a laminar-flow tubular section for ensuring laminar flow therein; said laminar-flow tubular section comprising a venturi-flow tubular portion, said venturi-flow tubular portion having a circular end-cross-section having a cross-sectional area substantially equal to said cross-sectional area of each of said plurality of different cross-sectional shapes.

**CLAIM 16.** A method of equalizing the dwell-time of each hypothetical section of flowing liquid in a dispensing nozzle, which nozzle comprises an unbranched interior flow passageway through which the liquid flows, said interior flow passageway defining a longitudinal axis along the length thereof and having an inlet section, an intermediate section, and an outlet opening, said method comprising:

(a) transporting said liquid through said intermediate section with substantially laminar flow;

(b) said step (a) comprising passing said liquid through a plurality of different cross-sectional shapes along said longitudinal axis with each said cross-sectional shape being defined in a plane transverse to said longitudinal axis and with each said cross-sectional shape having a cross-sectional area substantially equal to the cross-sectional area of another cross-sectional shape; and

(c) dispensing the liquid through the outlet opening.

**CLAIM 17.** The method according to claim 16, wherein said step (c) comprises dispensing the liquid through an outlet opening having a substantially elongated-like shape and having a cross-

sectional area greater than the cross-sectional area of each of said plurality of different cross-sectional shapes.

**CLAIM 18.** A dispensing nozzle for dispensing fluid comprising:

an unbranched interior flow passageway through which the liquid flows;

said interior flow passageway defining a straight longitudinal axis along the length thereof and having an inlet section, an intermediate section and an outlet;

said intermediate section comprising a plurality of different cross-sectional shapes along said longitudinal axis; each said cross-sectional shape being defined in a plane transverse to said longitudinal axis;

each said cross-sectional shape defining a cross-sectional area substantially equal to the cross-sectional area of another said cross-sectional shape.

**CLAIM 19.** The dispensing nozzle according to claim 18, wherein said outlet has a shape similar to the shape of the last cross-sectional shape of said intermediate section adjacent thereto, whereby substantial laminar flow through said intermediate section and substantial equality of dwell-time of each hypothetical section of flowing liquid in said intermediate section occurs; said plurality of different cross sections comprising a first series of substantially circular cross-sectional shapes, a second series of substantially ellipse-like cross-sectional shapes, and a third series of substantially elongated cross-sectional shapes.

**CLAIM 20.** A dispensing nozzle comprising:

an interior flow passageway through which the liquid elastomer from said mixing head flows;

said interior flow passageway defining a longitudinal axis along the length thereof, and having an inlet section in fluid cooperation with said outlet of said mixing head, an intermediate section, and an outlet opening;

said intermediate section comprising a plurality of different cross-sectional shapes along said longitudinal axis; each said cross-sectional shape being defined in a plane transverse to said longitudinal axis; and

each said cross-sectional shape defining a cross-sectional area substantially equal to the cross-sectional area of every other said cross-sectional shape of said plurality of different cross-sectional shapes.